



2012 Michigan Environmental Compliance Conference

Pollution Prevention and Energy
Efficiency Recommendations

RETAP

Pollution Prevention (P2)

General

- Establish an Environmental Affairs Team
 - Establish P2 / Sustainability Policies
 - Set Goals and Deadlines
 - Periodically Evaluate Operations
 - Reward / Recognize Successes
- Institute a "Green Purchasing" Program
- Institute an Inventory Control Program
- Implement an EMS, Lean, Six Sigma, or other continuous improvement process
- Investigate voluntary P2 programs and initiatives

Hazardous Waste

- Collect and Recycle Universal Wastes:
 - Antifreeze
 - Batteries
 - Consumer Electronics
 - Electric Lamps
 - Mercury Containing Devices
- Collect and Recycle Used Electromagnetic Ballasts
- Depressurize and Flatten Empty Aerosol Cans
- Use Solvent Alternatives or Recycle Spent Solvents
- Reduce / Eliminate Pesticides and Herbicides
- Exchange Services: unused acids, bases, solvents, etc.
- Install Secondary Containment

Liquid Waste

- Contact local service stations or collection sites for no-cost disposal of used oil, or sell it to local businesses for use in oil burners.
- Recover oil for recycling or energy recovery
- Recycle coolants
- Reuse treated water
- Implement “green” cleaning supply usage

Solid Waste

- Identify the waste items disposed of in dumpsters and determine which are recyclable. Separate, collect, and recycle identified items present in significant quantities.
- For small quantities of recyclable materials, establish partnerships with nearby schools, government facilities, and/or businesses to combine recycling efforts.
- Donate usable items to schools, charities, etc.
- Purchase in bulk or work with vendors to reduce packaging
- Establish policies on printing (e.g. double sided)
- Recycle ink cartridges by returning to office supply stores
- Compost organic wastes
- Chip wood wastes



P2

Water & Sewer

- Eliminate Leaks
- Evaluate Water Conservation Technologies
- Reuse Treated Process Water
- Collect and Use Rainwater
- Utilize Water Efficient Landscaping
- Add Lawn Irrigation System Controls
- Install Separate Irrigation Meter (cost savings)
- Cooling Tower Evaporation Credit (cost savings)



Common Waste Related Cost Saving Opportunities

- On call / reduce dumpster pulls
- Source separate recyclables
- Bale cardboard
- Bid out trash / recycling contracts
- Eliminate late fees
- Waste oil burners for heat recovery



Energy Efficiency (E2)

General

- Establish a procedure for a technical management person to receive, review, technically analyze and approve the utility invoices monthly and to monitor trends over time.
- Investigate all possible causes of inefficient energy use and set a goal to improve energy efficiency over the next several years.
- Institute a program requiring the purchase of Energy Star® rated products and building materials.

E2

Basics

- Retrofit exit sign lamps with screw-in bulbs equipped with LEDs.
- Disconnect lights and ballasts from vending machines.
- Install 7-day timers for all coffeemakers.
- Remove unneeded office loads or add on/off controls
- Activate computer controls.
- Adjust the heating/cooling control systems to set the temperature during occupied and unoccupied hours.
- Move office cleaning operations to normal business hours.
- Clean the cooling fins on A/C units on a regular basis.
- Eliminate air leaks, openings, and unneeded windows.
- Add insulation.



Common Energy Related Cost Saving Opportunities

- Improve Power Factor
- Reduce Peak Demand
- Shift Production to Off-Peak Hours
- Remove Redundant Meters
- Eliminate Late Fees
- Correct Utility Rates
- Utilize Utility Rebates
- Correct Manufacturers State Sales Tax Exemption
- Evaluate Alternative Gas Providers

E2

Lighting

- Conduct a lighting illumination audit throughout the facility, using a light meter.
- Replace T12 fluorescent lighting with more efficient T8 fluorescent lamps and electronic ballasts, and reduce 4-lamp fixtures to two lamps each.
- Replace 400-watt metal halide fixtures with 6-lamp T8 fluorescent fixtures and metalized reflectors.
- Replace incandescent bulbs with screw-in compact fluorescent lamps (CFLs).
- Ensure that all exterior security lighting is operating properly, i.e., "on" only when dark.

E2

Lighting (cont'd)

- Disconnect or remove excess fixtures in storage areas. These areas need only 10 foot-candles of illumination.
- Install occupancy detectors to control the lighting in areas that are not continuously in use.
- Evaluate replacement of the outdoor lighting with more efficient lighting (e.g., CFL, LED).

E2

Compressed Air

- Ensure that all machinery and equipment items requiring compressed air have air pressure gauges and control valves installed.
- Reduce the operating pressure of the air compressor to the minimum required for the plant's pneumatic equipment.
- Institute a regular leak detection and repair program for the compressed air system.
- Lower each compressor's intake air temperature by supplying outside air.
- Vent the warm exhaust air from the compressors to the outside during warm weather and into the building during the heating season.
- Utilize synthetic lubricants in the air compressors.
- Evaluate looping the compressed air system.
- Install stainless steel steam traps to remove condensate.

E2

Heating & Cooling

- Landscaping for windbreaks and solar gain.
- Weatherize and add insulation to walls and ceiling.
- Replace manual and 24-hour programmable thermostats with 7-day programmable thermostats.
- Install ceiling fans in the areas where there is a differential of 7-10 degrees between the ceiling and normal occupant level task area.
- Replace windows with energy efficient insulated units.
- Clean infrared heaters to remove dust, dirt, and soot.
- Institute a program to make sure that HVAC equipment is working correctly and is tuned to the building's use (continuous commissioning).

Water Heating

- Eliminate Leaks
- Flush Tanks – Routine Maintenance
- Employ Water Conservation Equipment
- Lower Water Heater Temperature
- Install Water Heater Blanket
- Insulate Hot Water Pipes
- Use Temperature Setback Controls

Water Heating (cont'd)

- Use Hot Water Circulation Pump Controls
- Upgrade to High Efficiency Models
- Employ Point of Use Electric Water Heaters
- Evaluate Alternative Systems
 - Heat Pumps
 - Ground Source Heat Pumps
 - Solar Assisted
- Evaluate Drain Water Heat Recover

How can companies contact RETAP or get more Info?



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